

Appl. No. 09/417,016
Reply to Office Action of September 8, 2004

Attorney Docket: P63935US0

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1-10 (Cancelled)

Claim 11 (currently amended): An apparatus for processing a video signal comprising:

a detector to detect color gradation levels of an input video signal;

a generator to generate a plurality of dither coefficient signals, each coefficient signal carrying dither coefficients arranged in a matrix, weighting being applied to each dither coefficient for components of the input video signal each having a gradation level equal to or lower than a predetermined level in which the weighting to be applied becomes larger as the gradation level of each components becomes lower, the lower the gradation level, and the larger the weighting;

a detector to detect color gradation levels of an input video signal; and

an adder to add one of the coefficient signals to the signal components at predetermined gradation levels of the input video signal, thus outputting a video signal.

Claim 12 (original): The apparatus according to claim 11, wherein each coefficient signal carrying positive and negative coefficients arranged in an (n x m) matrix where "n" and "m" being positive integers larger than zero, the sum total of the coefficients being zero.

Claim 13 (currently amended): An apparatus for processing a video signal comprising:

a detector to detect a color gradation level of each of a plurality of pieces of dot data arranged in an (n x m) matrix pattern, n and m being a positive integer larger than zero, and the dot data being carried by an input video signal, the (n x m) matrix pattern corresponding to a part of a plurality of pixels in a matrix display panel;

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a ~~coefficient~~ generator to generate a plurality of first dither coefficients pattern signals each being selected from a plurality of predetermined dither coefficients pattern signals in accordance with the detected color gradation level of each dot data of the (n x m) matrix pattern, each generated first dither coefficients pattern signal carrying dither coefficients arranged in the (n x m) matrix pattern according to color gradation levels of data carried by an input video signal, the data being supplied to each of dot matrices that constitute pixels on a display panel, each pattern signal carrying dither coefficients arranged in a matrix corresponding to each dot matrix;

a selector to select one of the dither coefficients from each generated first dither coefficients pattern signal, each dither coefficient thus selected corresponding, in position, to each dot data in the (n x m) matrix pattern, and to combine dither coefficients thus selected from all of the generated first dither coefficients pattern signals, thus producing a second dither coefficients pattern signal carrying the selected and combined dither coefficients arranged in the (n x m) matrix pattern with respect to each dot matrix, thus outputting a dither coefficients pattern signal that carries the dither coefficients selected from the pattern signals and arranged in the matrix;

an adjuster to adjust the dither coefficients of the second dither coefficients selected by the selector and carried by the output-pattern signal so that the sum total of the dither coefficients of the second dither coefficients carried by the output-pattern signal is zero, thus producing a third dither coefficients pattern signal carrying the adjusted dither coefficients; and

an adder to add the third dither coefficient-adjusted pattern signal to the input video signal, thus outputting a video signal carrying the dot data to be supplied to the display panel.

Claim 14 (currently amended): The apparatus according to claim 13, wherein weighting is applied to the dither coefficients carried by each generated first dither coefficients pattern signal, the lower the gradation level, the larger the weighting.

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Claim 15 (currently amended): The apparatus according to claim 13 wherein the selector selects one dither coefficient for each predetermined unit of the dot data carried by the video signal or according to locations of the pixels on the display panel.

Claim 16 (cancelled)

Claim 17 (original): The apparatus according to claim 13, wherein each pattern signal carries an even number of the coefficients, addition of the coefficients in each of two group yielding zero when the coefficients are divided into the two groups, both groups including the same number of the coefficients.

Claim 18 (currently amended): The apparatus according to claim 13, wherein each pattern signal carries an odd number of the coefficients, the coefficient located at the center of the matrix pattern being zero.

Claim 19 (currently amended): The apparatus according to claim 13-16, wherein "n" and "m" are equal to each other.

Claim 20 (original): The apparatus according to claim 13, wherein each pattern signal carries the same number of the positive and the negative coefficients.

Claims 21-27 (cancelled)

Claim 28 (currently amended): A method of processing a video signal comprising the steps of:

detecting color gradation levels of an input video signal;

generating a plurality of dither coefficient pattern signals, each coefficient pattern signal carrying dither coefficients positional data indicating locations of dither coefficients on pixels arranged in a matrix on a display panel, weighting being applied to each dither coefficient for components of the input video signal each having a gradation

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level equal to or lower than a predetermined level in which the weighting to be applied becomes larger as the gradation level of each component becomes lower; and

generating a dither coefficient signal carrying the dither coefficients arranged in a matrix for each gradation level of an input video signal in response to one of the pattern signals;

adding one of the dither coefficient signals signal to the components of the input video signal, thus outputting a video signal to be supplied to the display panel; and

wherein the addition step comprises the step of adding the coefficient signal to the input video signal at gradation levels equal to or lower than a predetermined level.

Claim 29 (currently amended): A method of processing a video signal comprising the steps of:

detecting a color gradation level of each of a plurality of pieces of dot data arranged in an (n x m) matrix pattern, n and m being positive integer larger than zero, and the dot data being carried by an input video signal, the (n x m) matrix pattern corresponding to a part of a plurality of pixels in a matrix display panel;

generating a plurality of first dither coefficients pattern signals, each being selected from a plurality of predetermined dither coefficients pattern signals in accordance with the detected color gradation level of each dot data of the (n x m) matrix pattern, each generated first dither coefficients pattern signal carrying dither coefficients arranged in the (n x m) matrix pattern according to color gradation levels of data carried by an input video signal, the data being supplied to each of dot matrices that constitute pixels on a display panel, each pattern signal carrying dither coefficients arranged in a matrix corresponding to each dot matrix;

selecting one of the dither coefficients from each generated first dither coefficients pattern signal, each dither coefficient thus selected corresponding, in position, to each dot data in the (n x m) matrix pattern, and to combine dither coefficients thus selected from all of the generated first dither coefficients pattern signals, thus producing a second dither coefficients pattern signal carrying the selected and combined dither coefficients arranged in the (n x m) matrix pattern with respect to each dot matrix;

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~~thus outputting a dither coefficients pattern signal that carries the dither coefficients selected from the pattern signals and arranged in the matrix;~~

~~adjusting the dither coefficients selected in the selecting step and carried of the second dither coefficients by the output pattern signal so that the sum total of the dither coefficients of the second dither coefficients carried by the output pattern signal is zero, thus producing a third dither coefficients pattern signal carrying the adjusted dither coefficients; and~~

~~adding the third dither coefficient-adjusted pattern signal to the input video signal, thus outputting a video signal carrying the dot data to be supplied to the display panel.~~

Claim 30 (currently amended): The method according to claim 29, wherein the pattern signal generating step comprises the step of applying weighting to the dither coefficients carried by each generated first dither coefficients pattern signal, the lower the gradation level, the larger the weighting.

Claim 31 (currently amended): The method according to claim 29 wherein the selection step comprises the step of selecting one dither coefficient for each predetermined unit of the dot data carried by the video signal or according to locations of the pixels on the display panel.

Claim 32 (currently amended): The method according to claim 29, wherein the first dither coefficients pattern signals are generated so that each pattern signal carries an even number of the coefficients, addition of the coefficients in each of two group yielding zero when the coefficients are divided into the two groups, both groups including the same number of the coefficients.

Claim 33 (currently amended): The method according to claim 29, wherein the first dither coefficients pattern signals are generated so that each pattern signal carries an odd number of the coefficients, the coefficient located at the center of the matrix pattern being zero.

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Claim 34 (new): The apparatus according to claim 11, wherein gradation levels of the components of the input video signal are divided into gradation groups, the weighting to be applied becomes larger as the gradation level of each components becomes lower for the gradation groups.

Claim 35 (new): The method according to claim 28, wherein gradation levels of the components of the input video signal are divided into gradation groups, the weighting to be applied becomes larger as the gradation level of each component becomes lower for the gradation groups.